What is claimed is:

1. A numerical-simulation method for rotary metal forming which:

divides into a plurality of finite elements a predetermined model zone between two imaginary cutting planes intersecting with a circumferential direction in a rotary formed body rotated about an axis of rotation;

expresses velocity boundary conditions of said imaginary cutting planes for said model zone by a function where angular velocity for rotation about said axis of rotation of said rotary body is made a variable; and

analyses by a finite element method a forming process which continuously produces plastic deformation by localized contact with said rotary formed body.

2. A numerical-simulation method for rotary metal forming according to claim 1, wherein in the case where said axis of rotation is displaced with addition of an increase in diameter of said rotary formed body in said forming process, said velocity boundary conditions are expressed by a function having three variables comprising; an increasing rate of the diameter of said rotary formed body, said angular velocity for rotation about said axis of rotation of said rotary formed body, and a correction value for traverse velocity of said axis of rotation.

3. A numerical-simulation method for rotary metal forming according to claim 1, wherein said velocity boundary conditions are expressed by a function having other variables capable of conversion into said variables.

4. A numerical-simulation method for rolling metal forming according to claim 1 wherein

a Euler method where said finite elements are spatially fixed is applied with respect to the rotation direction of said rotary body, and

a Lagrange method where said finite elements are movable with said rotary formed body is applied with respect to a direction along said axis of rotation of said rotary body and the radial direction of said rotary body.

5. A numerical-simulation method for rotary metal forming according to claim 1, involving;

dividing a non-model zone outside of said model zone of said rotary body by elements for data storage, and of said two imaginary cutting planes, sequentially storing data related to said velocity boundary conditions output from one of said imaginary cutting planes in said elements and inputting from an other of said imaginary cutting planes, or

computing said data for said non-model zone using interpolation related to the angle about said axis of rotation, based on said data at said one of said imaginary cutting planes and said data at said other of said imaginary cutting planes, and

inputting from said other of said imaginary cutting planes.

6. A recording medium recorded with,

a program for making a computer function as a fixed axis of rotation time conversion section which:

divides into a plurality of finite elements a predetermined model zone between two imaginary cutting planes intersecting with a circumferential direction in a rotary formed body rotated about an axis of rotation; and

expresses velocity boundary conditions of said imaginary cutting planes for said model zone by a function where angular velocity for rotation about said axis of rotation of said rotary formed body is made a variable;

and a program for making said computer function as an analyzing section which analyses by a finite element method a forming process which continuously produces plastic deformation by localized contact with said Rotary formed body.

7. A recording medium according to claim 6, recorded with a program for making said computer function as a boundary condition conversion section for, in the case where said axis of rotation is displaced with addition of an increase in diameter of said rotary formed body in said forming process, expressing said velocity boundary conditions by a function having three variables comprising; an increasing rate of the diameter of said rotary formed body, said angular velocity for rotation about said axis of rotation of said rotary formed body, and a correction value for traverse velocity of said axis of rotation.

8. A recording medium according to claim 6, recorded with a program for making said computer function as a variable conversion section for expressing said velocity boundary conditions by a function having other variables capable of conversion into said variables.

9. A recording medium according to claim 6, recorded with a program for making said computer function as an integrating section which applies a Euler method where said finite elements are spatially fixed, with respect to the rotation direction of said rotary formed body, and applies a Lagrange method where said finite elements are movable with said rotary formed body, with respect to a direction along said axis of rotation of said rotary formed body and the radial direction of said rotary formed body.

10. A recording medium according to claim 6, recorded with a program for making said computer function as a data setting section for dividing a non-model zone outside of said model zone of said rotary formed body by elements for data storage, and of said two imaginary cutting planes, sequentially storing data related to said velocity boundary conditions output from one of said imaginary cutting planes in said elements and inputting from an other of said imaginary cutting planes, or

computing said data for said non-model zone using interpolation related to the angle about said axis of rotation, based on said data at said one of said imaginary cutting planes and said data at said other of said imaginary cutting planes, and

inputting from said other of said imaginary cutting planes.

11. A program for making a computer function as a fixed axis of rotation time conversion section which:

divides into a plurality of finite elements a predetermined model zone between two imaginary cutting planes intersecting with a circumferential direction in a rotary formed body rotated about an axis of rotation; and

expresses velocity boundary conditions of said imaginary cutting planes for said model zone by a function where angular velocity for rotation about said axis of rotation of said rotary formed body is made a variable;

and a program for making said computer function as an analyzing section which analyses by a finite element method a forming process which continuously produces plastic deformation by localized contact with said rotary formed body.

12. A program according to claim 11, for making said computer function as a boundary condition conversion section for, in the case where said axis of rotation is displaced with addition of an increase in diameter of said rotary formed body in said forming process, expressing said velocity boundary conditions by a function having three variables comprising; an increasing rate of the diameter of said rotary formed body, said angular velocity for rotation about said axis of rotation of said rotary formed body, and a correction value for traverse velocity of said axis of rotation.

13. A program according to claim 11, for making said computer function as a variable conversion section for expressing said velocity boundary conditions by a function having other variables capable of conversion into said variables.

14. A program according to claim 11, for making said computer function as an integrating section which applies a Euler method where said finite elements are spatially fixed, with respect to the rotation direction of said rotary formed body, and applies a Lagrange method where said finite elements are movable with said rotary formed body,

with respect to a direction along said axis of rotation of said rotary formed body and the radial direction of said rotary formed body.

15. A program according to claim 11, for making said computer function as a data setting section for dividing a non-model zone outside of said model zone of said rotary formed body by elements for data storage, and of said two imaginary cutting planes, sequentially storing data related to said velocity boundary conditions output from one of said imaginary cutting planes in said elements and inputting from an other of said imaginary cutting planes, or

computing said data for said non-model zone using interpolation related to the angle about said axis of rotation, based on said data at said one of said imaginary cutting planes and said data at said other of said imaginary cutting planes, and

inputting from said other of said imaginary cutting planes.